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Coccomyces hubeiensis, a new fungus of *Rhytismatales* from China

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Abstract —A new fungus found on fallen leaves of *Rhododendron erubescens* from the Shennongjia forestry region of Hubei Province, China, is described as *Coccomyces hubeiensis*. This species differs from *C. dentatus* by its asci with subtruncate-conical apices, paraphyses branched near the top, infrequent zone lines, and the absence of conidiomata. The type specimen is deposited in the Reference Collection of Forest Fungi of Anhui Agricultural University, China (AAUF).

Key words —*Rhytismataceae*, morphology, *Ericaceae*

Introduction

Coccomyces De Not., established by de Notaris in 1847, is now placed in the *Rhytismatales* (*Leotiomycetes*, *Ascomycota*) (Kirk et al. 2008). *Coccomyces* taxa are characterized by polygonal or more or less circular ascomata that open by several radiate or irregular splits, cylindrical to clavate asci, and filiform, long-fusiform, or clavate ascospores, often with gelatinous sheaths (Sherwood 1980; Cannon & Minter 1986; Johnston 1986, 2000; Spooner 1990; Lin et al. 1994; Jia et al. 2012). External shape, size, and ascomal openings, ascal shape and size, and the shape of paraphyses at the apex are regarded as the most important taxonomic characters (Johnston 1986; Lin 1998).

Twenty-five *Coccomyces* species have been reported in China (Korf & Zhuang 1985; Lin 1998; Hou et al. 2006, 2007; Jia et al. 2012; Zheng et al. 2012) since Teng (1934) first recorded *C. dentatus* on *Quercus* and *Castanea* and *C. delta* on *Lauraceae*. Recently, a new *Coccomyces* species was found on fallen leaves of *Rhododendron erubescens* in the Shennongjia forestry region, Hubei Province.

Materials & methods

Mature ascomata with macroscopic characteristics of *Rhytismataceae* were selected from the collected specimens. We observed external shape, size, color, the opening

mechanisms of ascomata, and zone line characteristics using a stereoscope with 10–50× magnification.

The fruitbodies were rehydrated in water for 10 min, and 10–15 μm thick sections of the ascomata were cut using a freezing microtome. Microscopic examinations were mounted in water, 5% KOH, Melzer's reagent, or 0.1% (w/v) cotton blue in lactic acid. For observing the outlines of ascomata in vertical section, sections were mounted in lactic acid or cotton blue with pretreatment in water. The gelatinous matrix surrounding ascospores and paraphyses was observed in water or cotton blue in lactic acid. The color of internal structures was observed in water. Measurements and drawings of asci, ascospores, and paraphyses were made using material mounted in 5% KOH or Melzer's reagent and from 30 ascospores, asci, and paraphyses for each specimen. Illustrations of external shapes and internal structures of the ascomata were prepared using the Panasoianic XSJ-2 microscope drawing device.

Taxonomy

Coccomyces hubeiensis Y.R. Lin & M.S. Yang, **sp. nov.** Figs 1–5

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Differs from *Coccomyces dentatus* by its branched paraphyses and asci with subtruncate-conical apices and from *C. cyclobalanopsis* by its lack of excipulum and periphysoids.

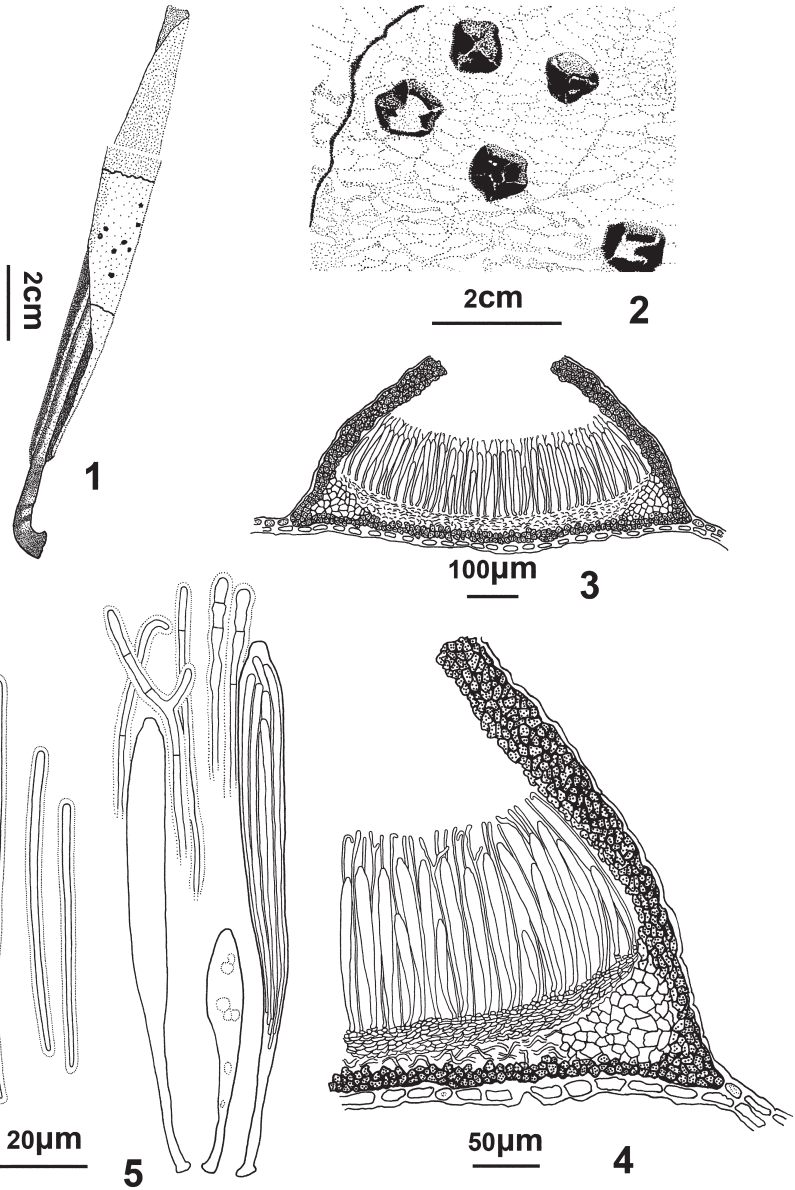
Type: China, Hubei, Shennongjia forestry region, Xiaolongtan, alt. 1300m, on fallen leaves of *Rhododendron erubescens* Hutch. (*Ericaceae*), 9 July 2010, Y.R. Lin, J.L. Chen & Q. Zheng 2385 (AAUF 68493).

Etymology: *hubeiensis*, referring to the province where the specimen was collected.

Zone lines black-brown, infrequent, surrounding the bleached spots.

Conidiomata not observed.

Ascomata on both sides of the fallen leaves, but predominantly on the upper side, sparsely scattered in light grey-white, subcircular or irregular bleached areas 15–25 mm diam. without obvious edges. In surface view, ascomata triangular to pentagonal, 570–950 μm diam., shining black, moderately raising above the surface of leaf but flat or slightly hollow in the centre portion, with an obvious preformed dehiscence mechanism, opening by 3–5 radial splits which extend nearly to the edge of ascoma to expose the light yellow-brown hymenium. Lips absent. In median vertical section, ascomata intraepidermal. Covering stroma 30–35 μm thick near the opening, composed of black-brown textura epidermoidea or angularis with thick-walled cells 4–7 μm diam., aliform cells mainly existing near the inner layer of the covering stroma, becoming thinner towards the edge gradually and extending to the basal stroma. Excipulum absent. Basal stroma 10–18 μm thick, consisting of textura angularis with 2–3 rows of black-brown, thick-walled cells 4–6 μm diam. Colorless, thin-walled, large angular cells 6–12 μm diam. exist between the covering stroma and basal stroma. Internal matrix stroma poorly developed, comprised of hyaline, gelatinised textura intricata. Subhymenium 15–20 μm thick, composed of



Figs 1–5. *Coccomyces hubeiensis* on *Rhododendron erubescens*. 1. Habit on a leaf. 2. Detail of ascomata and a zone line. 3. Ascoma in median vertical section. 4. Portion of ascoma in median vertical section. 5. Paraphyses, asci and ascospores.

colorless textura porrecta-intricata. Paraphyses filiform, 90–150 × 1.5–2 μm, septate, the tips gradually swollen to 2.5–3 μm, rarely curved or branched, and sometimes forming epithecium above the asci, enveloped in mucus 0.8–1.2 μm thick. Asci ripening sequentially, cylindric-clavate, 80–120 × 7.5–10 μm, apex subtruncate-conical, without circumapical thickening, thin-walled, somewhat long-stalked, J–, 8-spored. Ascospores arranged in a fascicle, filiform, 65–102 × 1.5–1.8 μm, hyaline, aseptate, gradually tapered to the round distal end, with a gelatinous sheath ca 1 μm thick.

Host species & distribution: producing ascomata on fallen leaves of *Rhododendron erubescens*; known only from the type locality, Hubei, China.

Comments—*Coccomyces dentatus* is closely related to *C. hubeiensis* in the shape of asci and in the absence of lips, periphysoids, and excipulum, but differs in ascomata that are quadrate to hexagonal, black zone lines, the presence of abundant conidiomata, and paraphyses that are apically unbranched and do not form an epithecium (Sherwood 1980). *Coccomyces coronatus* is distinguished from the new species by its orbicular or polygonal ascomata, short-stalked larger asci (100–130 × 11–13 μm), and shorter and wider ascospores (60–80 × 2–2.5 μm) (Sherwood 1980). *Coccomyces hubeiensis* resembles *C. cyclobalanopsis* in the shape and size of ascomata, paraphyses, and ascospores as well as in the color of the exposed hymenium. However, *C. cyclobalanopsis* differs in having small abundant bleached spots, a covering and basal stroma consisting of a textura globulosa, and an extremely well-developed excipulum arising from the inner layer of the covering stroma (Lin et al. 2000).

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Literature cited

Cannon PF, Minter DW. 1986. The *Rhytismataceae* of Indian subcontinent. Mycol. Pap. 155: 1–123.

Hou CL, Piepenbring M. 2007. Two new species of *Rhytismataceae* on twigs of conifers from Yunnan Province, China. Mycotaxon 102: 165–170.

Hou CL, Kirschner R, Chen CJ. 2006. A new species and new records of *Rhytismatales* from Taiwan. Mycotaxon 95: 71–79.

Jia GJ, Lin YR, Hou CL. 2012 ["2011"]. A new species of *Coccomyces* (*Rhytismatales*, *Ascomycota*) from Mt. Huangshan, China. Mycotaxon 118: 231–235. http://dx.doi.org/10.5248/118.231

Johnston PR. 1986. *Rhytismataceae* in New Zealand 1. Some foliicolous species of *Coccomyces* de Notaris and *Propolis* (Fries) Corda. New Zealand J. Bot. 24: 89–124.

Johnston PR. 2000. *Rhytismatales* of Australia: the genus *Coccomyces*. Aust. Syst. Bot. 13: 199–243. http://dx.doi.org/10.1071/SB98034

Kirk PM, Cannon PF, Minter DW, Stalpers JA. 2008. Ainsworth & Bisby's dictionary of the fungi, 10th ed. CAB International. Wallingford. 771 p.

Korf RP, Zhuang WY. 1985. Some new species and new records of *Discomycetes* in China. Mycotaxon 22: 483–514.

Lin YR. 1998. Studies on *Coccomyces* de Notaris and *Neococcomyces* gen. nov. in China. [Ph.D. thesis; in Chinese]. Northeast Forestry University. Harbin. 98 p.

Lin YR, Liu HY, Tang YP, Hu BF. 1994. Two new species of the genus *Coccomyces* from China [in Chinese]. Acta Mycol. Sin. 13: 8–12.

Lin YR, Li ZZ, Huang CC, Xiang CT. 2000. Studies on the genus *Coccomyces* from China II [in Chinese]. Mycosystema 19: 297–301.

Sherwood MA. 1980. Taxonomic studies in the *Phacidiales*: The genus *Coccomyces* (*Rhytismataceae*). Occ. Pap. Farlow Herb. Crypt. Bot. 15: 1–120.

Spooner BM. 1990. *Coccomyces* and *Propolis* (*Rhytismatales*) from Mt Kinabalu, Borneo. Kew Bulletin 45: 451–484. http://dx.doi.org/10.2307/4110513

Teng SC. 1934. Notes on *Discomycetes* from China. Sinensia 5: 431–465.

Zheng Q, Lin YR, Yu SM, Chen L. 2012 ["2011"]. Species of *Rhytismataceae* on *Lithocarpus* spp. from Mt Huangshan, China. Mycotaxon 118: 311–323. http://dx.doi.org/10.5248/118.311